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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,966	11/26/2003	Martin Dionne	71624 CCD	9523

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EXAMINER

LEADER, WILLIAM T

ART UNIT	PAPER NUMBER
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1742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/25/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/723,966

Applicant(s)

DIONNE ET AL.

Examiner

William T. Leader

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Receipt of the papers filed on October 30, 2006, is acknowledged. Claims 9-20 have been canceled. New claim 21 has been presented. Claims 1-8 and 21 are pending.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Bergeron et al (CA 2 350 814 A1) and Townsend (5,227,045), newly cited.
4. As indicted in the previous office action, the admitted prior art is that found on pages 1-3 of the specification under the heading "Background of the Invention." The admitted prior art shows that a process for making cathodes for an aluminum reduction cell by forming a composite of a carbon-containing component and a metal boride such as titanium diboride is known.
5. The process of instant claim 1 differs from that of the admitted prior art by reciting the inclusion of an additive with specified properties in addition to the carbon-containing component and titanium diboride (TiB₂) of the admitted prior art. The Bergeron et al document is directed to a process for making a cathode for an aluminum reduction cell. Bergeron et al disclose that the cost of metal borides such as titanium diboride is high, while the cost of metal oxides and boron oxides, which constitute precursors of metal borides, is considerably lower. Bergeron et al

disclose that metal boride can be made in situ when subjected to heat by providing a mixture of metal boride precursors in admixture together with a carbonaceous material. The precursors may be a mixture of boron oxide and titanium dioxide. See page 4, line 30 to page 5, line 26 and page 7, lines 18-28. The precursor materials must be mixed together before they are mixed with other components of the cathode materials (page 5, line 28 to page 6, line 3). The precursor materials of Bergeron et al correspond to the additive recited in the instant claims.

6. Applicant has amended claim 1 to recite that the cell component is wettable by molten aluminum. Newly presented claim 21 recites that 40% by weight or more of the TiB_2 is mixed with the carbonaceous material. As noted above, the admitted prior art discloses that a process for making cathodes for an aluminum reduction cell by forming a composite of a carbon-containing component and a metal boride such as titanium diboride is known. In particular, the specification teaches that

It has been known for a number of years that cathodes can be made from a composite of a carbon-containing component and a metal boride, such as titanium diboride (TiB_2). The TiB_2 helps to protect the cathode against erosion and oxidation and makes the cathode wettable to aluminum. The wettability is an important characteristic particularly in drained cathode cells.

See page 1, lines 21-28. Thus, the admitted prior art teaches that the composite is wettable as recited in claim 1 as amended, but does not specify how much TiB_2 is needed to bring about this wettability. The Townsend patent is directed to electrowinning molten aluminum. Similar to the admitted prior art, Townsend teaches that a cathode surface that can be wetted by the molten aluminum can be made by mixing divided titanium diboride with carbon cement containing non-graphic carbon or pitch to form composite materials containing carbon and titanium diboride

(column 5, lines 15-19). Townsend additionally teaches that if these materials contain over about 20% by volume titanium diboride, they may be wetted on a macroscopic scale (column 5, lines 28-32).

7. It would have been obvious at the time the invention was made to have provided sufficient titanium diboride so that the carbon-titanium diboride composite component was wettable because both the admitted prior art and Townsend teach that wettability is an important characteristic, and to have replaced a portion of the titanium diboride mixed with a carbon-containing component of the admitted prior art with precursors which form titanium diboride in situ as taught by Bergeron et al because the cost of the finished cathode would have been reduced since the precursors are considerably less expensive than the titanium diboride itself. Choice of an amount of titanium diboride to have mixed with the carbanaceous material, such as 40% by weight or more as recited in claim 21 in the process of the admitted prior art, would have been obvious because it is known in the art that about 20% or more by volume is needed to make the composite component wettable.

Response to Arguments

8. Applicant's arguments have been carefully considered but are not deemed to be persuasive. A page 4 of the Remarks, applicant states that the present invention is not concerned about achieving cost savings by using precursors of TiB_2 , but rather it is concerned with a procedure for preventing leaching of metal borides from carbonaceous cathode blocks and refractory coatings. While this may be correct, the cost savings taught the Bergeron provide a

motivating factor to replace some of the TiB_2 used in making the composite component of the admitted prior art and Townsend with precursors since they are less expensive. There is no requirement that a motivating factor for combining references be the same factor which prompted an applicant to combine the disclosed steps.

9. Applicant's arguments are directed at the Bergeron patent, but do not specifically address the combination of Bergeron with the admitted prior art. At page 6 of the Remarks, applicant states that the amounts of 3 to 10% by weight of TiB_2 used by Bergeron is not enough to produce a wettable material. While this may be correct, the admitted prior art on which the rejection is based, as well as the newly cited Townsend patent, teach that the components are wettable. Thus, they would necessarily contain a sufficient amount of TiB_2 , which Townsend discloses is over 20% by volume, to produce this wettability. The rejection is based on the substitution of some of the TiB_2 used in the prior art with precursors which will form the TiB_2 in situ and will result in lower cost.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WTL
William Leader
January 17, 2007

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700